Winter Summary 2006: A Season of Innovation

Rain Rain Go Away Precipitation levels peaked throughout western Washington for a few weeks in December and January. Olympia, home of the State Capitol, experienced the third wettest January ever, and broke the record for consecutive rainfall with 34 days. Statewide, the torrential rains that saturated the earth resulted in 92 slides on state highways.

WSDOT crews clear trees, mud and debris on SR 20 east of Concrete in Skagit County. 1/11/2006

SR 107 - Buckling of the roadway surface. 1/10/2006

SR 9 in Whatcom County just south of Acme. The road is shifting and sinking. There is a 300-foot long crack in the road. 2/3/2006

SR 105 Washaway Beach, washes away. 1/12/2006

- **SR 107, near Montesano in Grays Harbor County**

Severe roadway damage from heavy rains forced the closure of this section of roadway December 29. Sections of the highway surface cracked and buckled, and the roadway slid horizontally as much as 25 feet. Once the slope stabilized, crews established a temporary gravel road so traffic could get through once again. The road was reopened by Friday, Jan. 13.

WSDOT placed road signs directing motorists to reduce speed to 35 mph in both directions of SR 107 leading up to the slide area. A stop sign was installed at each end of the gravel section, and both signs are lighted. After stopping, motorists could proceed at 10 mph through the section. WSDOT did not have to place load restrictions on the gravel road.

- **SR 20, east of Concrete in Skagit County**

WSDOT closed the road Jan. 10 when more than 10 dump truck loads of mud and debris slid off the hillside and onto the road. Crews were able to open all lanes of SR 20 east of Concrete on Jan. 11.

- **SR 9 near Acme (east of Bellingham) in Whatcom County**

WSDOT closed all lanes of SR 9 north of Doran Road on Friday, Feb. 3 after saturated soil beneath the road moved, causing the road to sink and opening a 300-foot long crack. The same thing was happening to the south, but on a smaller scale. Repairs addressed the underlying structure of the roadway.

WSDOT crews reopened State Route 9 to traffic Feb. 28, after nearly four weeks of emergency work and total road closures. All work is complete and there are no longer weight restrictions on the highway.

Crews worked seven days a week to complete the project and good weather contributed in helping to finish early.

- **SR 105 at Wash Away Beach in Pacific County**

SR 105 was closed to traffic when eight feet of embankment was eroded by unusually high tides and stormy weather on Dec. 20. Repairs were completed and the road was re-opened for traffic on Jan 29.

For More Information Contact:

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Washington State Department of Transportation

Winter Summary 2006

A Season of Innovation

October 2005 - March 2006

Each winter season seems to develop its own, unique character as it unfolds from late October to early April. While the numbers of average temperatures and precipitation totals are adding up to a statewide winter that is not out of the ordinary compared to winters past, a few extraordinary events have made it feel far from routine. Two major rock fall incidents on I-90, one solid month of record-breaking rainfall in western Washington, and greater-than-average mountain snowfall have given WSDOT crews and the traveling public some challenging obstacles to overcome.

This winter WSDOT plowed enough snow from Washington passes to fill Qwest Field more than seven times.

Washington State Department of Transportation

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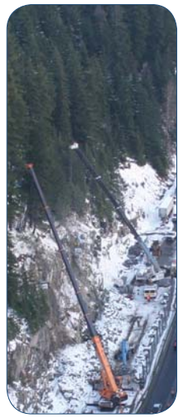
I-90 Rock Fall

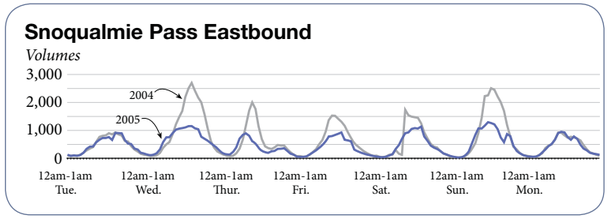
Two, major rock falls that occurred on I-90 at Snoqualmie Pass in September and November 2005 were the first of several challenging events of the winter season. While the process of stabilizing the rock slopes was technically challenging, keeping traffic moving through the work zones and communicating with the traveling public were two areas where WSDOT implemented creative solutions with strong teamwork.

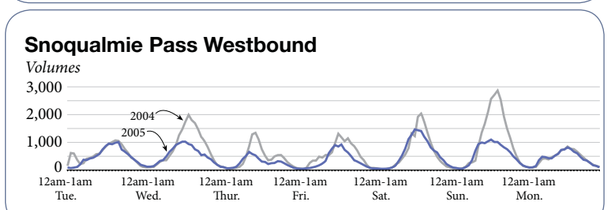


Maintenance responded initially by clearing rock fall from the roadway and setting up traffic control. Communications personnel quickly contacted the media and updated Web pages so I-90 travelers could plan their travels accordingly.

Contractors immediately went to work on an emergency basis to stabilize the roadside slope that still presented a hazard to motorists. Traffic control maximized travel mobility and work zone safety. Portable cameras connected to the WSDOT Web site provided around-the-clock images of the work zone and nearby traffic conditions. Communications staff updated daily progress reports on the WSDOT Web site.

Under normal circumstances, Thanksgiving weekend travel can be challenging over Snoqualmie Pass. Traffic volumes are higher than normal and sometimes early season snowstorms can make for tough travel. WSDOT, the Washington State Patrol, and even the Governor helped to get the message out to the public to make alternative plans for I-90 travel over the holiday weekend. As shown in the accompanying charts, traffic volumes were well below levels from the previous year and the feared traffic jams were averted.





A statewide media blitz by WSDOT communicators minimized the delays during the popular travel holiday hours.

"As much as we all want to be with loved ones, a trip across the mountain pass is not advisable," the governor said. "First and foremost, I want everyone to be safe and comfortable during the Thanksgiving week."
Gov. Christine Gregoire, King 5 News, Nov. 23, 2005

"We need your help. Please avoid traveling across the Cascades this holiday week."
WSP Chief John Batiste at a press conference with the governor and Sec. MacDonald on November 18, 2005.

"We know this is a sacrifice, but please avoid traveling across the Cascades during the upcoming Thanksgiving weekend."
Secretary Doug MacDonald, KOMO news, November 22, 2005

Mountain Snowfall

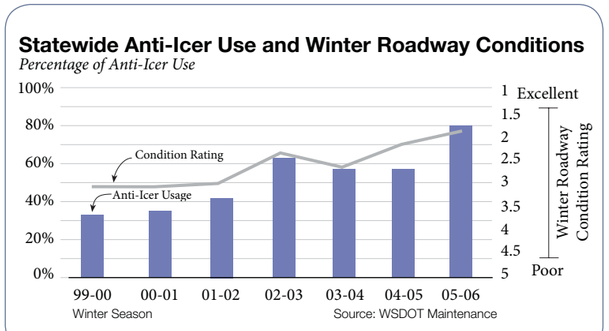
Snow levels have been above-average this year. On Snoqualmie Pass, the total snowfall was 445 inches. The season total average snowfall on Snoqualmie Pass over the last ten years is 398 inches. Snowfall totals on Stevens Pass and White Pass were also above average this past winter. In the lower elevations of both eastern and western Washington, temperatures and snowfall have been average.

WSDOT plowed more than 31 million cubic yards of snow from mountain passes this winter. If this snow were concrete, it would be enough to build two and one half Grand Coulee Dams.

Anti-icer Use and Road Conditions

Each winter WSDOT measures its snow and ice control performance by assessing the travel conditions at random locations throughout the state highway system.

Through weekly field surveys at these locations, road conditions are evaluated and rated on a scale of one (road conditions with best traction) to five (road conditions with least traction). Over the last few years, increased anti-icer use and improved techniques have resulted in a higher level of service for snow and ice control. Better winter road conditions lead to improved safety, fewer road closures, and reduced need for studded tires.



WSDOT applied sand or deicer on 506,000 lane miles this winter to improve safety. This is equivalent to driving around the earth more than 20 times at the equator.

Shifting Resources

WSDOT is now in the practice of shifting resources outside of their assigned, organization boundaries.

For winter maintenance, it means moving snowplows and maintenance personnel from an area where no snow is forecast to another area where there is a forecast for significant snowfall. This occurs in advance of a snowstorm where six or more inches of snow is forecast over less than a 12 hour period. This scenario plays out most frequently on our mountain pass highways. Equipment and crews are typically shifted from the lowlands up to the mountain passes. Maintenance supervisors make contingency plans for coverage of those roadways normally manned by the crews sent to the pass.

This effective management of resources can result in as many as twenty additional snowplows and associated equipment made available in the mountain passes. This allows for more frequent snow removal and deicer application runs, as well as more effective individual snowplow runs, with up to five plows operating in tandem. The larger snowplow teams can clear multiple lanes in a given direction at the same time.

Shifting resources allows more coverage for the areas that need it most.

Avalanche Control

When the snow piles up and conditions are right, avalanches result. For the Washington State Department of Transportation, it means travelers over mountain pass highways would be at risk without a comprehensive program to control when and how the unstable snow pack above the roadway is brought down.

Specially trained avalanche control teams are stationed at Hyak near the summit of Snoqualmie Pass on I-90 and at Berne Camp near the summit of Stevens Pass on US 2. The teams' purpose is to decrease the hazard of avalanches for travelers and reduce the duration of winter highway closures.

WSDOT active avalanche control is the intentional triggering of avalanches. In a controlled environment, traffic is safely stopped, snow removal equipment is at hand and the roadway can be re-opened to traffic most quickly. The work is usually necessary during times of heavy snowfall but to be most effective, avalanche control is done when the snow is becoming unstable before it would slide naturally. When possible, the timing of avalanche control work is scheduled during non-peak traffic hours to minimize travel disruptions. This year WSDOT performed 87 avalanche control missions.

Incidence Response Team

WSDOT's Incident Response (IR) Program got its start in the urban areas of the Central Puget Sound region where IR vehicles could quickly respond to accidents to help clear roads and keep traffic moving. The IR program has since moved up into the mountain passes. The NC region provides an IR truck during the winter months to help motorists on Stevens Pass. Due to the large amounts of truck traffic using Snoqualmie Pass, WSDOT has teamed up with the Washington Trucking Association to provide a specially-outfitted truck to help push trucks up and over the summit during tough, winter road conditions. Dubbed IRXtreme, this truck has been outfitted with a special bumper for pushing large trucks and is loaded with heavy weights and chained up to gain traction in the worst of road conditions. In one particularly busy day this past winter, IRXtreme pushed 26 big rigs up the eastbound steep grade just below Snoqualmie Summit.

IRXtreme on Snoqualmie Pass

IR truck at Stevens Pass

WSDOT avalanche technicians Bram Thrift, Ron Gibson holding his dog Kuri, and John Stimberis. Kuri is trained and used for avalanche rescue activities.

WSDOT's Mike Stanford loads the Avalanche Guard located on the east side of Stevens Pass. The Avalanche Guard remotely fires charges out onto the slope to trigger avalanches in a controlled environment.

Traffic Flow Management

One of the biggest risks during heavy snowfall at Snoqualmie Pass is multiple-vehicle accidents caused by traffic bunching up behind slowed cars or trucks; a single spinout under these conditions can easily lead to a chain-reaction pileup, requiring the pass to be closed for extended periods.

WSDOT South Central Region has adapted a process used at California's Donner Pass to regulate the number of vehicles crossing a mountain pass in a given time. This process is called Traffic Flow Management (TFM), and is designed to reduce the risk of pass closures during severe weather. TFM involves the temporary reduction of lanes available to traffic at a point below the Snoqualmie Pass summit, with traffic released from the lane restriction in a way that naturally spaces out vehicle flow over the pass. This minimizes the chance of large-scale accidents, and aids in snow removal in two ways:

- gaps in traffic created by TFM ease the integration of snowplow teams into the traffic flow, allowing for more frequent snow removal runs.
- a reduced traffic rate reduces the compaction of snow on the roadway, making for easier and more effective snow removal.

TFM was first used on Snoqualmie Pass following the November 2005 rockslide to improve pass traffic conditions during the Thanksgiving weekend.

Keeping Snoqualmie Pass Open

In order to reduce vehicle incidents and prevent pass closures during periods of heavy snowfall, WSDOT developed an integrated approach toward keeping the I-90 Snoqualmie Pass open this winter. Using newer tactics such as shifting resources and Traffic Flow Management (TFM); along with a few other newer tools, the pass was kept open during conditions that historically kept the pass closed for extended periods of time.